IN THE SPECIFICATION:

Please replace paragraphs [0010], [0016], [0018], [0020]--[0023], [0026], [0027], [0029]--[0032], and [0034] with the following amended paragraphs:

[0010] In one embodiment, the invention provides a pumping member locatable in a production zone of a well, and a secondary lift mechanism, simultaneously present in the well bore to enhance artificial lifting of well fluids. Preferably, the secondary lift mechanism is a gas injected into a liquid, whereby the gas forms gas bubbles in the well fluid and enhances the buoyancy thereof for recovery of the fluid. ~~The gas preferably forms the gas bubbles adjacent the outlet of the pump at the down hole, i.e., production zone location.~~

[0016] Extending into production zone 18, and suspended on the end of a hollow tube 24, is a jet pump 26. As will be explained further herein, jet pump 26 includes an inlet section ~~28~~ 32 extending into fluid communication with the fluids in the production zone 18, a pumping liquid inlet 30 in fluid communication with the interior of hollow tube 24 (shown in Figure 2) and an outlet ~~32~~ 28 in fluid communication with the cased portion of the borehole 10. The fluid exiting the outlet ~~32~~ 28 flows upwardly in the borehole 10 in the space or annulus 66 between the hollow tube 24 and the casing 20 in the wellbore 10, to the earths' surface.

[0018] As also shown in Figure 1, the separation of well fluids and recovery of the pumping fluid is accomplished by fluid control system 80 located generally adjacent to wellhead ~~50~~ 12. The fluid control system 80 is configured to enable recirculation of the fluids returned from the wellbore 10 until a desired return of wellbore fluids is achieved, and thereafter either or both of the introduced gas, as well as the recovered wellbore fluids, may be recovered from the well and distributed from the system.

[0020] Referring still to Figure 1, high pressure system 82 generally includes multiphase pump 88, a fluid inlet 90, through which a relatively low pressure stream of a mixture of gas and liquid is conveyed into the low pressure, or entry ~~92~~, side of

multiphase pump 88, and a high pressure outlet line 94 extending from multiphase pump high pressure outlet to the end of hollow tube 24 extending upwardly through the wellhead ~~50~~ 12. Multiphase pump 88 is capable of receiving a mixture of ~~fluids~~ a liquid and ~~gasses~~ a gas, and simultaneously ~~compressing~~ pressurizing them, such that the fluid pressure in the exit of the pump may be sufficiently high to ~~compress~~ dissolve the gas into [[a]] the liquid ~~phase, mixed with the inlet fluid~~.

[0021] After the high pressure fluid is passed through the hollow tube 24, jet pump 26 and then upwardly in the annulus 66 between the casing 20 and the hollow tube 24, it exits the return outlet 68 and enters return system 84. Return system 84 provides separation of well fluids from the high pressure pumping fluid, as well as valving and control circuitry to determine the proper routing of the fluids returning from the well. As shown in Figure 1, a separator 96 is fed returning fluid through return conduit 98, which is selectively opened, closed or throttled by return valve 101 located in fluid communication with return outlet 68. Separator 96 separates gas in the returning fluid from liquids, such that gas is supplied therefrom to return gas line 100, and fluid is supplied therefrom to return liquid line 102. Return gas line 100 extends from separator 96 to a tee or junction 104, having a recycle gas line 106, and a production gas outlet 108 extending therefrom. Gas entering production gas outlet 108 may be fed to a gas flowline 110, or throttled or prevented from entering gas flowline 110, by gas outlet valve 112. Gas entering gas recycle line 106 will return to a pump low pressure inlet line 111 ported to the low pressure inlet ~~92~~ of the multiphase pump 88 through fluid inlet 90, unless throttled or restricted therefrom by gas recycle line valve 114. Thus, to divert gas for production from the well, gas recycle line valve 114 is closed and gas outlet valve 112 is opened. Contrary settings of these valves will divert the gas recovered from separator 96 to multiphase pump inlet line 90, for re-injection into the well. Furthermore, it is contemplated that intermediate valve settings may be used, such that some gas is recovered through flowline 110, while some is returned to the inlet line 90 of multiphase pump for re-injection into the well.

[0022] Liquid separated from the returning fluid recovered from the well passes into return line 102, and is likewise fed to a tee or junction 116, having a production side

outlet 118 which is controlled by liquid production valve 120, and a liquid recycle line 122, the access to which is controlled by liquid recycle valve 124. Each of liquid recycle valve 124 and liquid production valve 120, as well as gas outlet valve 112 and gas recycle valve 114, are electronically controlled, such as by a microprocessor controller or computer ~~150~~ 151, which controls their state of open, close or throttling as will be hereinafter described. To prevent backflow of fluids in the return lines 100, 102 and pump inlet lines 106, 128, as well as the possibility of gas flowing in a reverse direction in the liquid lines or liquid flowing in a reverse direction in the gas lines, each of at least lines 100, 102, 106 and 128 include one way valves (not shown) therein, such as check valves, which prevent rearward flow of fluids therepast, but allow forward flow of fluids therepast.

[0023] Liquid which is passed through liquid recycle valve 124 and is thus directed to be re-injected into the well enters cyclone 126, which separates solids from the liquid stream. Sand, as well as other production region solids, as well as accumulated mud or other impurities in the casing, will typically be returned from the wellbore through return outlet 68, and should be separated from any recycled liquids before such liquids enter the multiphase pump 88. Thus, cyclone 126 has extending therefrom recycle liquid pump return line 128, through which recycled liquid from the borehole is returned to the low pressure inlet ~~92~~ through inlet line 90 of multiphase pump 88, as well as a solid return line 130, which is configured for removal or conveyance of solids from the system, it being understood that the solids may be carried in a fluid stream upon exit from the cyclone 126. As shown in Figure 1, this solid material is shown as returning to the liquid production flowline 118 downstream of valve 120, although other disposal regimens are specifically possible.

[0026] Jet pump 26 generally includes a well fluid inlet region ~~28~~ 32, a high pressure pumping fluid inlet 30, a venturi section 150 into which both the high pressure pumping fluids flow, as shown by arrows 152, and well fluids flow, as shown by arrows 154. The combined well fluid/pumping fluid return stream then exits the pump 26 in a path shown by arrows 156, to return to the earths' surface 14 (Figure 1) by flowing out of pump exit ~~158~~ 28 and then upwardly in annulus 66.

[0027] Referring still to Figure 2, well fluid inlet 32 is extended into production zone ~~16~~ 18 of the well, at least co-terminus or extending beyond the lowermost surface of packer 50~~, to form fluid inlet 160~~. Fluid inlet extends inwardly of the housing or body of pump 26, to an entry check valve 162, having an entry fluid passage 164 therethrough selectively blockable by a ball 165 when pressure in the well fluid inlet ~~160~~ 32 is less than that in the pump 26. Fluid inlet then extends into a reservoir region 166, from which fluid is pulled by venturi section 150 through an annular passage 168 extending from the reservoir 166 to the venturi section 150.

[0029] Venturi 150 includes a tapered inlet 174, through which the high-pressure pumping fluids enter the venturi 150 and which ends in an orifice 176. Adjacent and preferably surrounding the orifice 176 at the exit of the orifice is an annular well fluid passage 178 in fluid communication through annulus 168 with well fluids to be pumped from the well, and a generally right cylindrical throat 180 extending co-linearly with the inlet 174 and in fluid communication with orifice 176 and annular well fluid passage 178. Throat 180 extends to a flared outlet 181 having a generally expanding diameter as it extends from throat 180, which then extends into outlet reservoir 182. Outlet reservoir 182 has an outlet 184 therefrom to direct the fluid leaving the venturi 150 into a pump production annulus 186 and thence to pump outlets ~~158~~ 28 (as shown by arrows 156) in fluid communication with annulus 66 to enable the fluid exiting the pump 26 to pass to the earths' surface 14.

[0030] As high pressure fluid is passed through the orifice ~~180~~ 176, and thus through the throat 180 and flared outlet 181 of the venturi 150, a pressure drop occurs at the annular well fluid passage 178, thus pulling well fluids existing at the passage 178 to flow into the stream of pumping fluid passing into throat 180, and thence out of the pump and to the ~~earths~~ earth's surface 14. Additionally, as the high pressure fluid ~~expands~~ travels to the earth's surface 14, the gas in the fluid will form bubbles 190 as it comes out of solution, to aid in the return of the combined high pressure ~~fluid well~~ fluid stream to the ~~earths'~~ earth's surface 14 and thus recovery of the well fluids by the control system 80.

[0031] Referring again to Figure 1, operation of the control system 80 of the present invention will be described. At start up, recoverable well fluids, preferably liquid or gaseous hydrocarbons, will be present in the production zone 18 of wellbore 10. To initiate the pumping of these well fluids, the jet pump 26 will be initially operated in a fluid only, i.e., a non-gas injected, mode. To accomplish this, fluid, typically in the form of crude oil as exists at the production zone 18, is continuously supplied from liquid supply 134 to the inlet 90 of the multiphase pump 82, whereby a high pressure well pumping fluid is sent through high pressure outlet 94 and thus into hollow tube 24 where such high pressure fluid enters the inlet ~~160~~ 30 of jet pump 26. The high pressure fluid passes through the pump 26 as previously described, pulling some of the well fluids into the stream of high pressure pumping fluid passing through the pump, and thence the combined fluids are returned to the control system 80 through annulus 66 and associate surface piping or lines. Once the hollow tube 24 and the return annulus 66 between the casing 20 and hollow tube 24 are filled with pumping fluid, the gas supply inlet valve 132 is opened, and gas is mixed with the pumping fluid and compressed in the multiphase pump 88, such that the gas is ~~no longer in gaseous state~~ dissolved in the liquid when it enters the hollow tube 24 with the high pressure pumping fluid. At this time the pumping rate is increased to increase the volumetric flow of pumping fluid entering the hollow tube 24.

[0032] As the high pressure well pumping fluid ~~passes through the venture~~ travels to the earth's surface 14, carrying well fluid therewith, the pressure drop experienced by the high pressure pumping fluid as it ~~passed through the venturi 150~~ travels to the earth's surface 14 causes the pressure in the exiting fluid to be below that at which the gas can remain in a liquid or solution phase, and the gas thus forms the bubbles 190 which will assist in the lifting of the returning combined fluid stream. When the combined stream of well pumping fluid, bubbles and well fluid reaches the separator 96, the gaseous portion is passed therefrom to the multiphase pump 88, routed through gas line 100, through return valve 114, with flowline valve 112 closed. Likewise, fluid recovered from separator 96 is returned to multiphase pump 88, flowing through valve 124, it being understood that valve 120 is closed, thereby preventing release of the returning fluid to the flowline. Thus the gas and well pumping fluid are both initially re-

pressurized and recycled down the well. At this point, additional liquid or gas from startup system may not be required, and if this is the case, then one or both of valves 132, 136 may be closed, as the situation dictates.

[0034] Once the flow rate of return of well fluid and well pumping fluid has reached an optimum condition, the liquid return valve 124 is throttled to a restricted condition, and the liquid flowline valve 120 is opened to a throttled open condition, to allow fluid in excess of that being pumped down the well, i.e., produced fluid, to pass into flowline for supply to a pipeline or reservoir. Likewise, where natural gas is returned from the well, gas recycle valve 114 is throttled to a restricted position while gas flowline valve 112 is opened to a restricted position, to allow excess gas recovered from the well to be sent down the flowline 110 for ultimate recovery. Preferably, flow meters readable by computer ~~150~~ 151 are also disposed in flow lines 110, 118, and in recycle liquid line 128 and recycle gas line 106, as is the flow meter on return line 98 and high pressure outlet line 94, so that computer ~~150~~ 151 can monitor, in real time, the flows through the various lines, and ensure that the portions of gas and liquid which are sent into flow lines 110, 118, do not exceed the excess fluid volume of each component returning from the wellbore 10.